Information Needs for the Double-Crested Cormorant in Midwestern North America, as Identified by an Audience Survey

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Double-crested cormorant (DCCO) research needs and data gaps were identified in the early 1990's by Erwin (1995) and Nisbet (1995). Erwin (1995) recommended four areas of research: (1) large-scale banding and marking to determine age- and sex-specific survival and fecundity, (2) studies of movements during migration and winter, (3) assessment of limiting factors such as contaminants and disease, especially in light of recent Newcastle disease in cormorants, and (4) evaluation of economic impacts of cormorants on cultured fishes and ways to reduce predation by fish-eating birds.

In his summary of the 1992 cormorant symposium, Nisbet (1995) commented that the population history and winter distribution of the DCCO are reasonably well known. Topics deserving further investigation and those for which there are insufficient data include population dynamics of cormorants; foraging behavior of cormorants in winter; functional relationships at aquaculture facilities between input parameters (number and size of fish stocked, quantity and quality of food, etc.) and output parameters (number, size, and quality of fish harvested); effect of cormorant predation on prey populations other than mere body-counts (e.g., assessing the net effects of cormorant activity); ecological and economic endpoints of the effectiveness of various control measures; and control methods that yield "positive system effects" (e.g., buffer prey and decoy ponds and alternatives to control, such as compensation, industrywide insurance, and greater use of an integrated pest management approach).

Many of these needs are still current in the late 1990's. But in an attempt to gain new insights into what researchers and managers feel are the current needs, we distributed a questionnaire to those in attendance at this symposium. We also distributed the questionnaire to noted cormorant researchers who were not at the meeting. In the questionnaire, we asked the audience to list current research needs and rank the eight needs that we included on the questionnaire.

Ten of 32 respondents provided additional needs. Others simply ranked the ones we identified. The top four information needs from those we identified were:

1. Assessment of cormorant impacts on local fish populations, i.e., those in small bays, inlets, and small lakes. Can these areas be "fished out" by cormorants? How quickly would new fish move in? (Of the respondents, 63 percent listed this as a "high" priority.)

2. Assessment of the magnitude of cormorant take of fish in open waters relative to available prey-fish biomass and to other prey-fish mortality factors. (Again, 63 percent of respondents rated this a high priority.)

3. For use in population models, collection of age-specific data on cormorant productivity, survival and recruitment rates, and information on how these parameters vary with population density and environmental factors. (Sixty-three percent of respondents also rated this as a high priority.)

4. Assessment of the relative costs and effectiveness of control techniques, both lethal (shooting, poisoning, egg-oiling) and nonlethal (harassment, exclusion, repellants, destruction of nests prior to egg laying). (Among all respondents, 41 percent rated this as a high priority.)

The other four identified needs received much lower rankings than those above:

5. Assessment of fish biomass in aquaculture ponds in relation to exclusion and harassment of cormorants. (Twenty-eight percent rated this as a high priority.)

6. Assessment of factors related to cormorant damage to vegetation. How long does it take a cormorant colony to irreparably damage its nest trees, etc.? (Nineteen percent rated this as a high priority.)

7. Study of migration ecology of Midwestern cormorants, including numbers and dates of passage (visible migration) along major rivers (e.g., Mississippi, Missouri, Wabash, Maumee, etc.), inland lakes, and the Great Lakes. (Thirteen percent rated this as a high priority.)

8. Determination of the transmission of fish diseases among aquaculture facilities visited by cormorants. (Again, 13 percent rated this as a high priority.)

Needs identified by the respondents included:

1. Determining how marked cormorants budget their feeding time among aquaculture facilities and natural wetland areas.

2. Determining how fish extraction rates by cormorants affect final fish production in aquaculture facilities. What is the impact of cormorants on fish harvest and economic return?

3. Conducting a nationwide public-opinion telephone survey to assess the general public's knowledge about, attitude toward, and reactions to various management options for DCCO's.

4. Collecting information on the monthly distribution and abundance of foraging cormorants in the Great Lakes in relation to hydrographic features, major prey stocks, colony locations, distance from shore, etc.

5. Determining the impacts of increased cormorant populations on other important stakeholder groups (besides fisheries interests), like birders, nearby residents, and outdoor recreationalists. Does increased activity by these groups offset any partial losses associated with lower fishing participation?

6. Determining immigration and emigration rates among breeding colonies and geographic regions (e.g., Great Lakes and Atlantic coast) to aid in identifying population sources and sinks.

7. Determining the genetic differences among various cormorant populations and subspecies.

8. Developing a flyway management plan that would establish population objectives and outline strategies for maintaining them.

9. Developing models that allow managers to evaluate the relative impact of cormorants on sport-fish populations compared to other forms of fish removal from the system. Such models would have to include the role or impact of cormorants on the entire food chain. Specifically, does removal of prey species by cormorants affect sport-fish growth rates, survival, or availability to human anglers?

10. Determining what happens to species of concern (e.g., rare colonial nesters) as cormorant numbers increase and displace them. Do they leave the area completely or just shift their nesting areas?

11. Further analysis of banding data to assess cormorant survivorship and longevity as well as relationships between breeding and wintering locations, natal and breeding sites, and fidelity to breeding sites.

Many of these subjects are management oriented and pertain to the Midwest area of the United States. This probably reflects how we, the authors and designers of the questionnaire, perceived the issues of the day as they pertain to cormorants, as well as the anticipated interests of the audience. We expected the audience at this symposium, which was held at the Midwest Fish and Wildlife Conference and sponsored by The Wildlife Society, to be heavily management oriented.

References Cited

Erwin, R. M. 1995. The ecology of cormorants: some research needs and recommendations. Colonial Waterbirds 18(Spec. Publ. 1): 240–246.

Nisbet, I.C.T. 1995. Biology, conservation and management of the double-crested cormorant: symposium summary and overview. Colonial Waterbirds 18(Spec. Publ. 1): 247–252.